

IN THE CLAIMS

1-30. (Cancelled)

31. (new) A voice activity detector that detects talkspurts in an input coded speech signal and an input voice/noise signal, comprising:

a first input controller that comprises a signal receiver and a decoder, wherein the signal receiver supplies the input coded speech signal to the decoder and the decoder decodes the input coded speech signal into a decoded speech data;

a second input controller that comprises a microphone and an A/D converter, wherein the microphone supplies the input voice/noise signal to the A/D converter and the A/D converter converts the input voice/noise signal into a voice/noise data of digital form;

a frequency spectrum calculator that calculates speech frequency spectrum of the speech data and calculates voice/noise frequency spectrum of the voice/noise data;

a flatness evaluator that calculates a speech flatness factor indicating flatness of the speech frequency spectrum and calculates a voice/noise flatness factor indicating flatness of the voice/noise frequency spectrum; and

(a) wherein, when the speech frequency spectrum is chosen for calculating the speech flatness factor,

the flatness evaluator finds a maximum value of the speech frequency spectrum, adds up differences between spectral components and the maximum value thereof, and generates resulting sum of the differences as the speech flatness factor;

(b) wherein, when the voice/noise frequency spectrum is chosen for calculating the voice/noise flatness factor,

the flatness evaluator finds a maximum value of the voice/noise frequency spectrum, adds up differences between spectral components and the maximum value

thereof, and generates resulting sum of the differences as the voice/noise flatness factor, and

wherein the flatness evaluator calculates an average of spectral components of the voice/noise data, normalizes the resulting sum of the differences by dividing by -the calculated average, and outputs a normalized voice/noise flatness factor; a voice/noise discriminator, performing:

(a1) determining whether the speech data contains a talkspurt, by comparing the speech flatness factor of the speech frequency spectrum with a first predetermined threshold,

(b1) determining whether the voice/noise data contains a talkspurt, by comparing the normalized voice/noise flatness factor of the voice/noise frequency spectrum with a second predetermined threshold.

32. (new) A voice activity detector that detects talkspurts in an input coded speech signal and an input voice/noise signal, comprising:

a first input controller that comprises a signal receiver and a decoder, wherein the signal receiver supplies the input coded speech signal to the decoder and the decoder decodes the input coded speech signal into a decoded speech data;

a second input controller that comprises a microphone and an A/D converter, wherein the microphone supplies the input voice/noise signal to the A/D converter and the A/D converter converts the input voice/noise signal into a voice/noise data of digital form;

a frequency spectrum calculator that calculates speech frequency spectrum of the speech data and calculates voice/noise frequency spectrum of the voice/noise data;

a flatness evaluator that calculates a speech flatness factor indicating flatness of the speech frequency spectrum and calculates a voice/noise flatness factor indicating flatness of the voice/noise frequency spectrum; and

(a) wherein, when the speech frequency spectrum is chosen for calculating the speech flatness factor,

the flatness evaluator that adds up differences between adjacent spectral components of the speech data and generates resulting sum of the differences as the speech flatness factor;

(b) wherein, when the voice/noise frequency spectrum is chosen for calculating the voice/noise flatness factor,

the flatness evaluator that adds up differences between adjacent spectral components of the voice/noise data and generates resulting sum of the differences as the voice/noise flatness factor, and

wherein said flatness evaluator calculates an average of spectral components of the voice/noise data, normalizes the resulting sum of the differences by dividing by the calculated average, and outputs a normalized voice/noise flatness factor;

a voice/noise discriminator, performing:

(a1) determining whether the speech data contains a talkspurt, by comparing the speech flatness factor of the speech frequency spectrum with a first predetermined threshold,

(b1) determining whether the voice/noise data contains a talkspurt, by comparing the normalized voice/noise flatness factor of the voice/noise frequency spectrum with a second predetermined threshold.